

I. Listing of Claims

1. (Previously Presented): A medical grasping device for grasping an object comprising:

an elongate control member continuously extending to an atraumatic distal tip section and a proximal end portion, said elongate control member further including a plurality of loops fixed to the elongate control member and located proximal said distal tip section;

an outer sheath with a passageway therethrough surrounding said elongate control member and relatively movable with respect thereto; and

the outer sheath and the elongate control member being relatively moveable to urge said plurality of loops from a distal end of said outer sheath and retraction thereinto, a radius of each loop expanding to overlap adjacent loops as the plurality of loops are urged distally from the distal end, the radius of each loop decreasing to tighten around the object as the plurality of loops are retracted into the outer sheath, when fully deployed each loop extending substantially perpendicular to a longitudinal axis of the elongate control member, the plurality of loops being substantially arranged in a cross-sectional region proximal from the atraumatic tip section, each loop extending radially outward from the elongate control member in the cross-sectional region and being equally spaced angularly around the elongate control member in the cross-sectional region, wherein said elongate control member is a flexible cannula defining a lumen extending therethrough into which a guide wire is receivable and movable with respect thereto.

2. (Cancelled).

3. (Previously Presented): The grasping device of claim 1, further comprising a hemostatic seal between said outer sheath and said elongate control member.

4. (Original): The grasping device of claim 1, wherein said outer sheath is flexible and kink-resistant and has lubricious outer and inner surfaces.

5. (Original): The grasping device of claim 1, wherein said atraumatic distal tip section tapers to a blunt and rounded tip.

6. (Previously Presented): The grasping device of claim 1, further comprising a control assembly disposed at a proximate end of said outer sheath and the elongate control member being relatively moveable to urge said plurality of loops from a distal end of said outer sheath and retraction thereinto, wherein said elongate control member is a flexible cannula defining a lumen extending therethrough into which a guide wire is receivable and movable with respect thereto;

wherein said control assembly includes an actuation section that is easily grippable for reciprocal movement along a handle to actuate said elongate control member with respect to said outer sheath to deploy and retract said grasping portion, respectively.

7. (Original): The grasping device of claim 6, wherein said actuation section includes a connecting block affixed to said elongate control member and is disposed within a longitudinal slot of said handle and is movable along said slot between opposite ends thereof.

8. (Previously Presented): The grasping device of claim 1, wherein said plurality of loops comprises a plurality of preformed wire loops.

9. (Previously Presented): The grasping device of claim 8, wherein said plurality of wire loops self-deploy transversely upon emerging from said distal end of said outer sheath, the wire loops self-deploying transversely proximal the atraumatic distal tip section.

10. (Original): The grasping device of claim 8, wherein each of said wire loops is substantially circular upon full deployment.

11. (Previously Presented): The grasping device of claim 10, wherein each of said wire loops includes side sections wherein each side section overlaps with a side section of a different adjacent loop of the plurality of wire loops.

12. (Previously Presented): The grasping device of claim 8, wherein each of said wire loops is pie-shaped and includes arcuate outer sections having a radius that

expands to a radius of a deployment site of a vessel into which the grasping device is inserted.

13. (Previously Presented): The grasping device of claim 1, wherein said plurality of loops comprises four preformed wire loops that self-deploy transversely upon emerging from said distal end of said outer sheath approximately equally spaced angularly about a longitudinal axis of said elongate control member and thereby generally expands to occupy a full cross-section of a vessel into which the grasping device is inserted.

14. (Previously Presented): The grasping device of claim 1, wherein said plurality of loops comprises a plurality of wire loops that each are formed from a superelastic alloy.

15. (Previously Presented): The grasping device of claim 1, wherein said plurality of loops having proximal end portions that are joined to said elongate control member at affixation joints and initially extend axially from said elongate control member even when said wire loops emerge from said distal end of said outer sheath and self-deploy transversely of a longitudinal axis of the grasping device.

16. (Original): The grasping device of claim 15, wherein each of said wire loops includes an arcuate outer section that upon deployment extends toward a wall of a vessel into which the grasping device is inserted.

17. (Original): The grasping device of claim 16, wherein each of said wire loops includes arcuate side sections that extend toward an axial center of said grasping portion and then curve gradually toward said distal end of said elongate control member to proximal ends that are affixed by said affixation joints thereto and are in axial alignment therewith adjacent to said affixation joints.

18. (Original): The grasping device of claim 17, wherein said wire loops comprise nitinol wire segments.

19. (Original): The grasping device of claim 18, wherein each of said wire loops including said proximal ends are within a cold-worked bend of a respective one of said nitinol wire segments.

20. (Previously Presented): The grasping device of claim 1, wherein:  
said outer sheath is flexible and kink-resistant and has lubricious outer and inner surfaces;

said control assembly includes an easily grippable actuation section along a handle to actuate said elongate control member with respect to said outer sheath; and

said grasping portion comprises a plurality of preformed wire loops of nitinol that upon deployment extend generally forwardly and radially outwardly to substantially traverse the cross-sectional area of the vessel wall into which the grasping device is inserted, each of said wire loops including an arcuate outer section of complementary shape to a vessel wall portion upon deployment, and including side

sections that extend toward an axial center of said grasping portion and then curve gradually toward said distal end of said elongate control member to proximal end sections that are affixed by affixation joints to said elongate control member and are in axial alignment therewith adjacent to said affixation joints.

21. (Cancelled).

22. (Previously Presented): A medical grasping device for grasping an object comprising:

an elongate control member having an atraumatic distal tip section and a proximal end portion, the elongate control member further including a grasping portion proximal the distal tip section;

an outer sheath with a passageway therethrough surrounding the elongate control member and relatively movable with respect thereto; and

the outer sheath and the elongate control member being relatively moveable to urge the plurality of loops from a distal end of the outer sheath and retraction thereinto; wherein:

the elongate control member is a flexible cannula defining a lumen extending therethrough into which a guide wire is receivable and movable with respect thereto;

the outer sheath is flexible and kink-resistant and has lubricious outer and inner surfaces; and

the grasping portion comprises a plurality of preformed wire loops of nitinol that upon deployment extend outwardly to traverse the cross-sectional area of the vessel wall into which the grasping device is inserted, a radius of each loop expanding to overlap adjacent loops as the plurality of preformed wire loops are urged distally from the distal end, the radius of each loop decreasing to tighten around the object as the plurality of preformed wire loops are retracted into the outer sheath, each of the wire loops including an arcuate outer section of complementary shape to a vessel wall portion upon deployment, and including side sections that extend toward an axial center of the grasping portion and curve gradually toward the distal end of the elongate control member to proximal end sections that are affixed by affixation joints to the elongate control member and are in axial alignment therewith adjacent to the affixation joints, when fully deployed each loop extending substantially perpendicular to a longitudinal axis of the elongate control member, the plurality of loops being substantially arranged in a cross-sectional region proximal from the atrumatic tip section, each loop extending radially outward from the elongate control member in the cross-sectional region and being equally spaced angularly around the elongate control member in the cross-sectional region.

23. (Previously Presented): The grasping device of claim 1, wherein the elongate control member being configured to transfer torque to the plurality of loops.

24. (Previously Presented): The grasping device of claim 1, wherein each of the wire loops is pie-shaped upon deployment from the distal end of the outer sheath,

each wire loop having an arcuate outer section, the arcuate outer sections cooperating to form a circular perimeter substantially perpendicular to a longitudinal axis of the elongate control member, each arcuate outer section having a radius about equal to a radius of the circular perimeter, each wire loop having an opening, the openings cooperating to substantially fill the circular perimeter, further wherein moving the elongate control member distally relative to the outer sheath expands the circular perimeter and cooperatively expands the radius of the arcuate outer sections thereby increasing the openings of the wire loops to again substantially fill the circular perimeter.

25. (Previously Presented): The grasping device of claim 1, wherein the grasping portion comprises four preformed wire loops, wire segments of the four preformed wire loops being initially oriented axially to the elongate control member, the wire segments deflecting radially and diverging from one another as the four preformed wire loops begin to open, the four preformed wire loops self-deploy transversely from said distal end of said outer sheath, said four preformed wire loops after self-deploying transversely are approximately equally spaced angularly about a longitudinal axis of said elongate control member and thereby generally occupy a full cross-section of a vessel into which the grasping device is inserted.